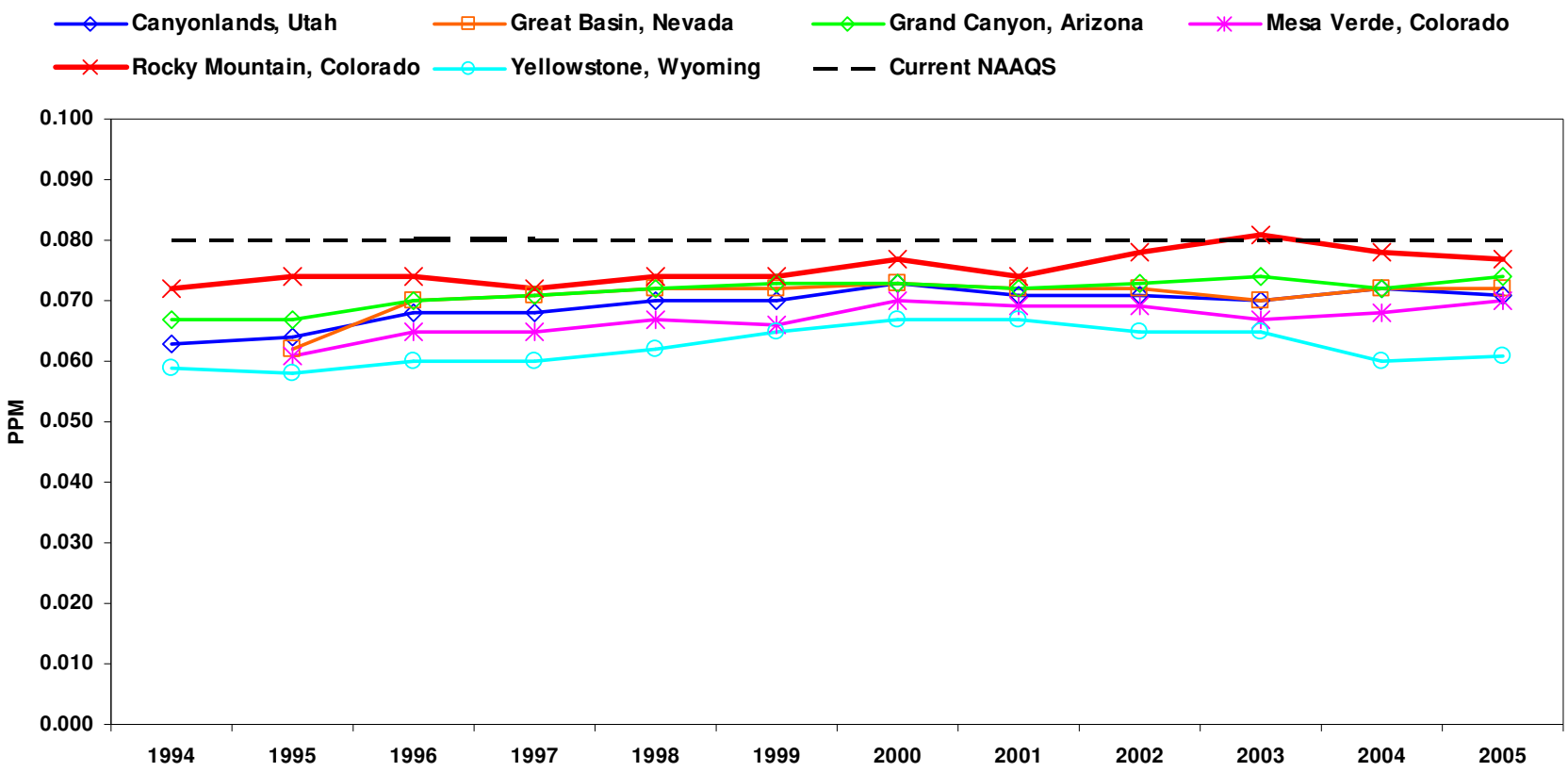
UDAQ Perspective: NEPA Related Monitoring and Modeling

EPA/BLM Meeting
Vernal, Utah
8/28/2007

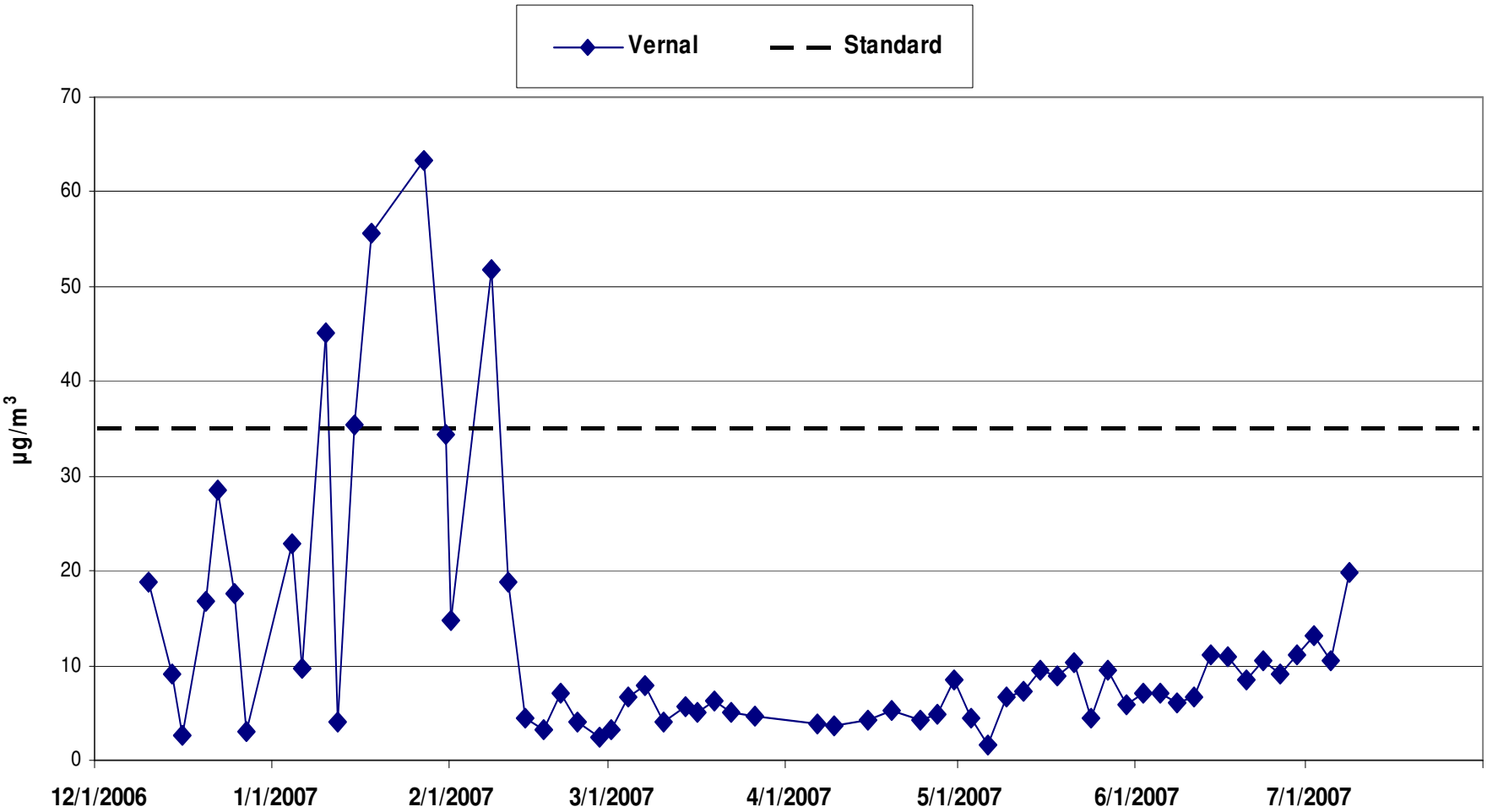
Department of Environmental Quality  Division of Air Quality

Intermountain National Parks
4th Highest 8-Hour Maximum Ozone Value



Department of Environmental Quality Division of Air Quality

24-Hour Average $PM_{2.5}$ at Vernal, 12/06 - 7/07



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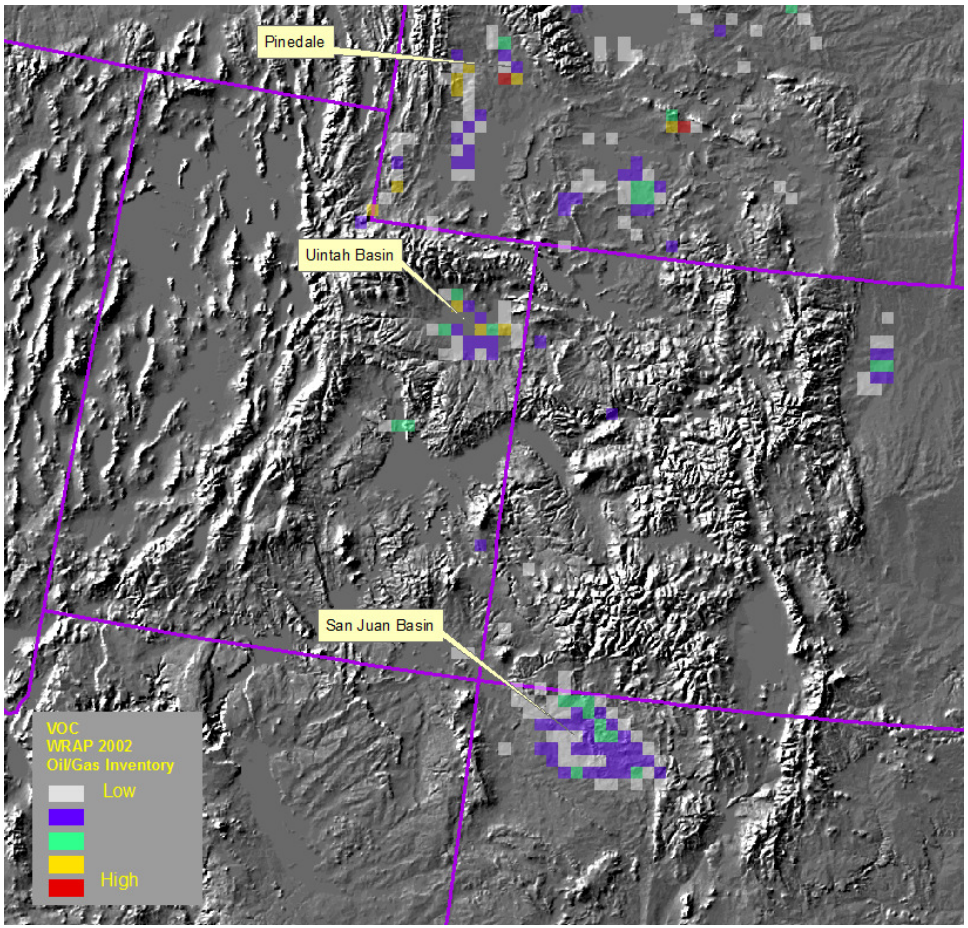
Monitoring Conclusions

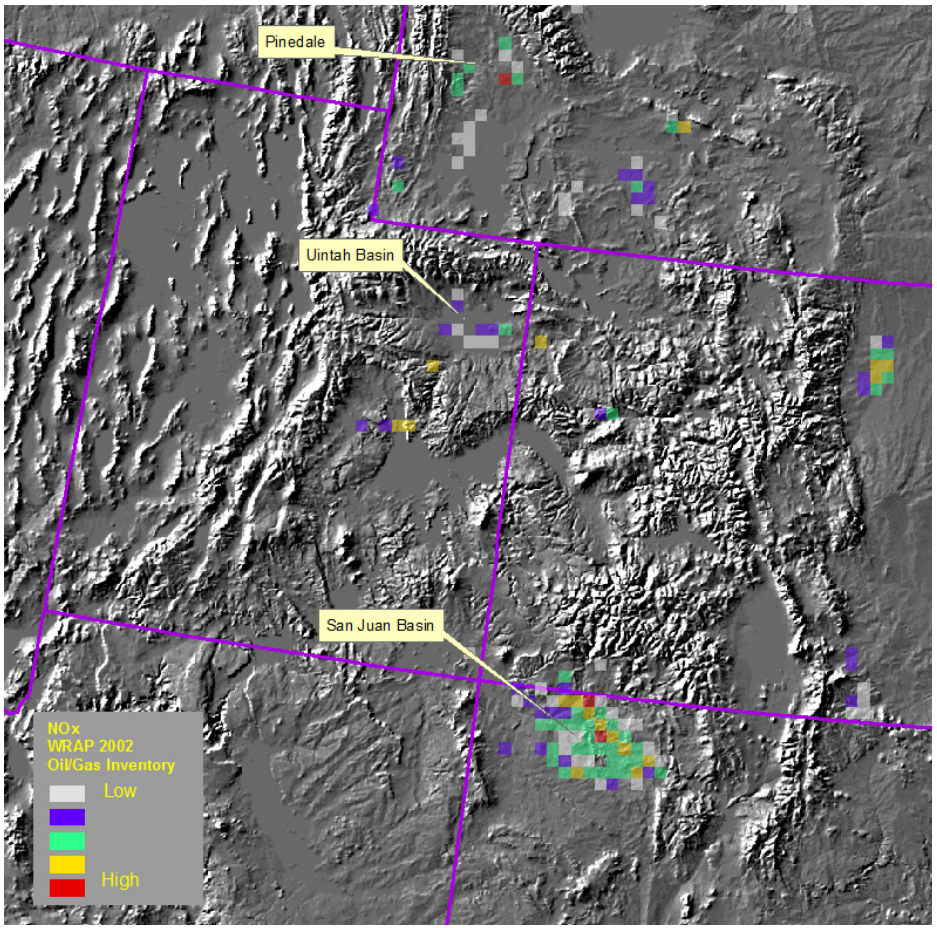
- NPS Ozone trending upwards but not reaching current standard
- Could be over the standard if standard lowered
- $PM_{2.5}$ monitoring in Vernal showed values over the standard during January inversion
- Need additional Ozone and $PM_{2.5}$ monitors to establish a baseline and the regional nature of the values

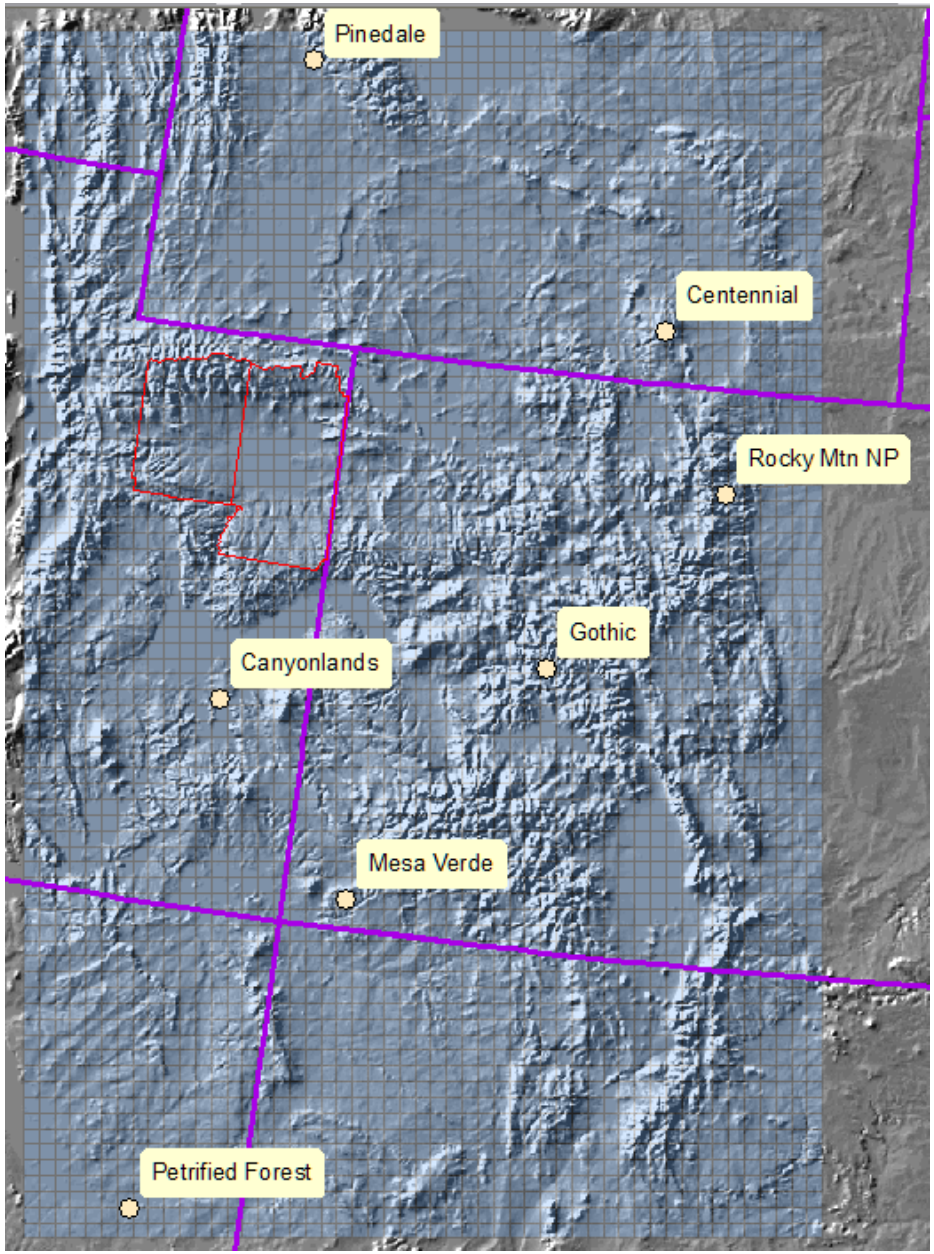
WRAP 2002 Oil & Gas Emissions Inventory

VOC



NO_x




Pinedale
Centennial
Rocky Mtn NP
Gothic
Canyonlands
Mesa Verde
Petrified Forest

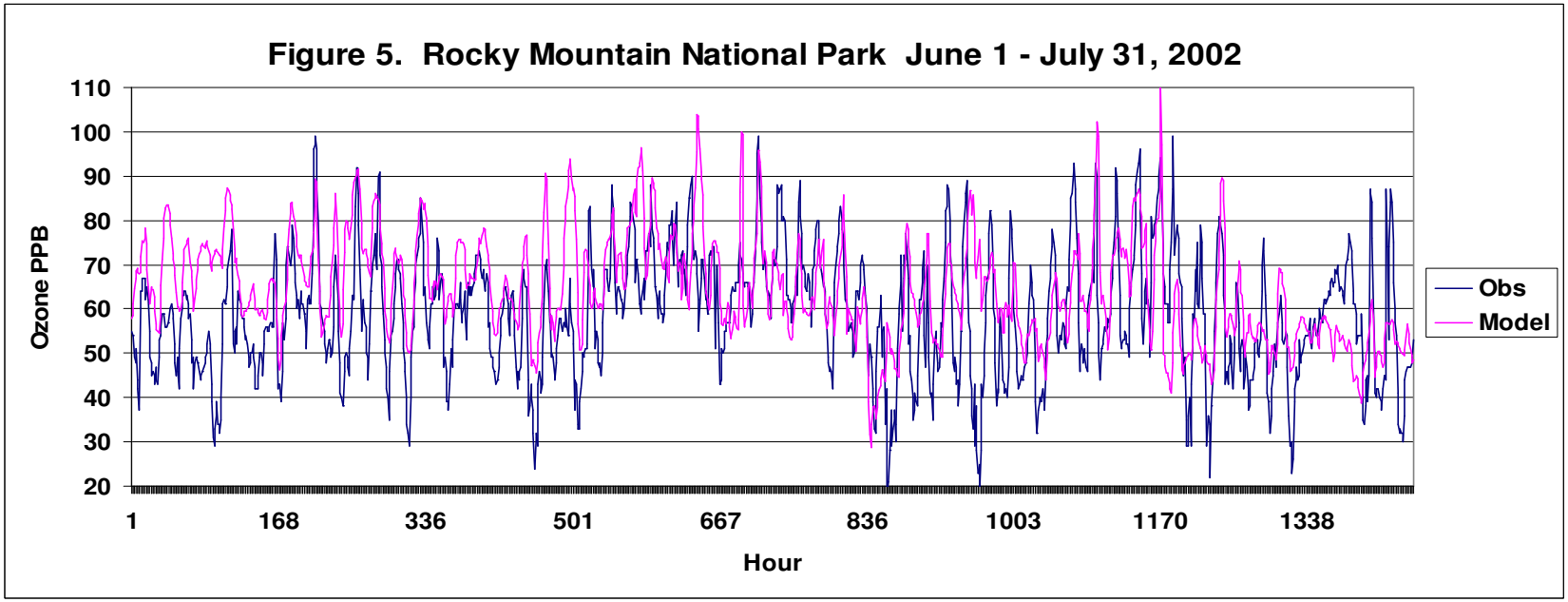


Figure 5. Rocky Mountain National Park June 1 - July 31, 2002
Ozone PPB
110
100
90
80
70
60
50
40
30
20
1
168
336
501
667
836
1003
1170
1338
Hour
Obs
Model

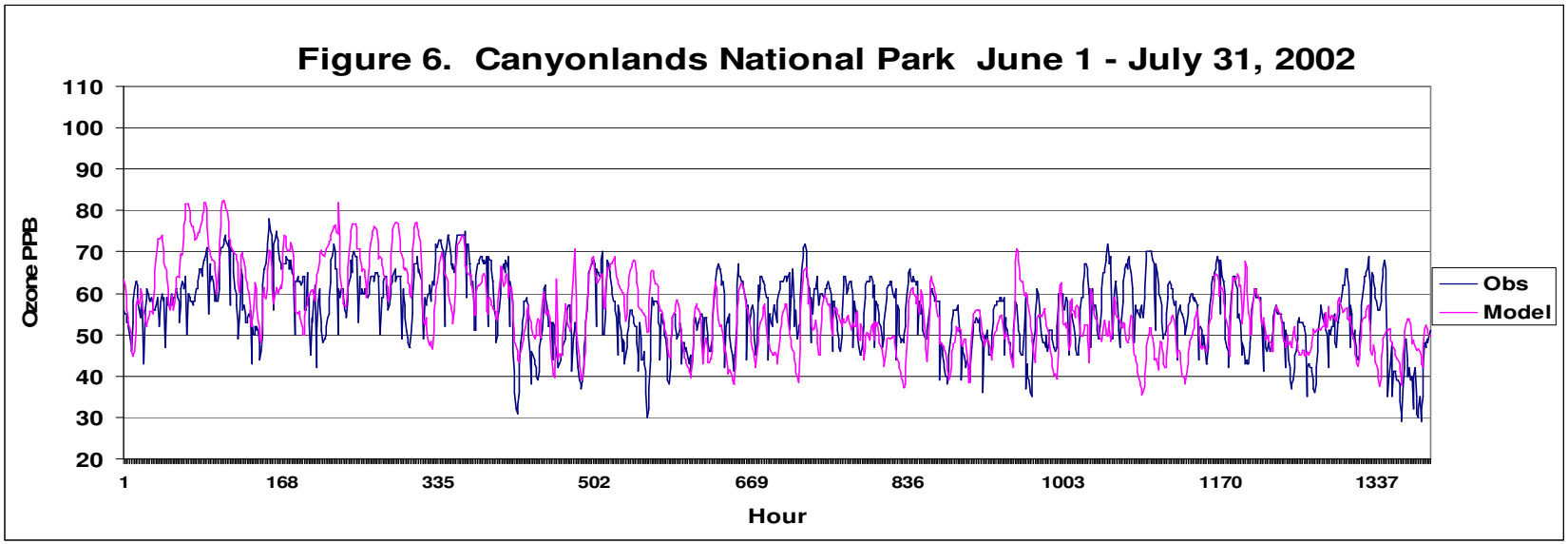


Figure 6. Canyonlands National Park June 1 - July 31, 2002
Ozone PPB
110
100
90
80
70
60
50
40
30
20
1
168
335
502
669
836
1003
1170
1337
Hour
Obs
Model

Modeling Conclusions

- Limited modeling studies focus on primary pollutants
- Several regional oil and gas modeling studies in the planning stage
- WRAP RH modeling shows good performance for ozone but grid resolution is coarse

Impact Analysis

1. **Assume that current leasing and exploration activities will result in full-field development.**
   - Base modeling on reasonable foreseeable development scenarios that consider the total number of wells

2. **Include nearby existing and planned sources that may have coincident impacts (cumulative).**

3. **Evaluate using worst-case meteorological conditions for each dispersion scenario.**
   - Meteorological conditions for high near-field impacts are different than those leading to long-range transport

4. **Address compliance and attainment with all applicable air quality requirements and standards.**
   - Consider all criteria pollutants (CO, NO_x, SO_2, Pb, PM, and O_3)
   - Especially $PM_{2.5}$, O_3 and their precursors
   - A photochemical model, e.g. CMAQ, is needed to estimate the formation of secondary pollutants of O_3 and $PM_{2.5}$

5. Address impacts on Air Quality Related Values (AQRVs) at Class I areas.

- Visibility
- Contribution to Regional Haze
- Deposition
- Sensitive flora and fauna

6. Convene an interagency task force to:

- Facilitate comprehensive, region-wide air quality analyses using photochemical modeling
- Stakeholders to include representatives from:
  - BLM, assume leadership role as the major land manager
  - USFS
  - NPS
  - EPA
  - Tribes
  - State of Utah

Recommendations for Regional Photochemical Modeling

1. Establish Stakeholder Group – Tech Committee
2. Leverage current data and knowledge
3. Establish domain, sources and receptors
4. Hire modeling contractor
5. Evaluate current and future development
6. Identify future high impacts
7. Use tagged species approach for source apportionment

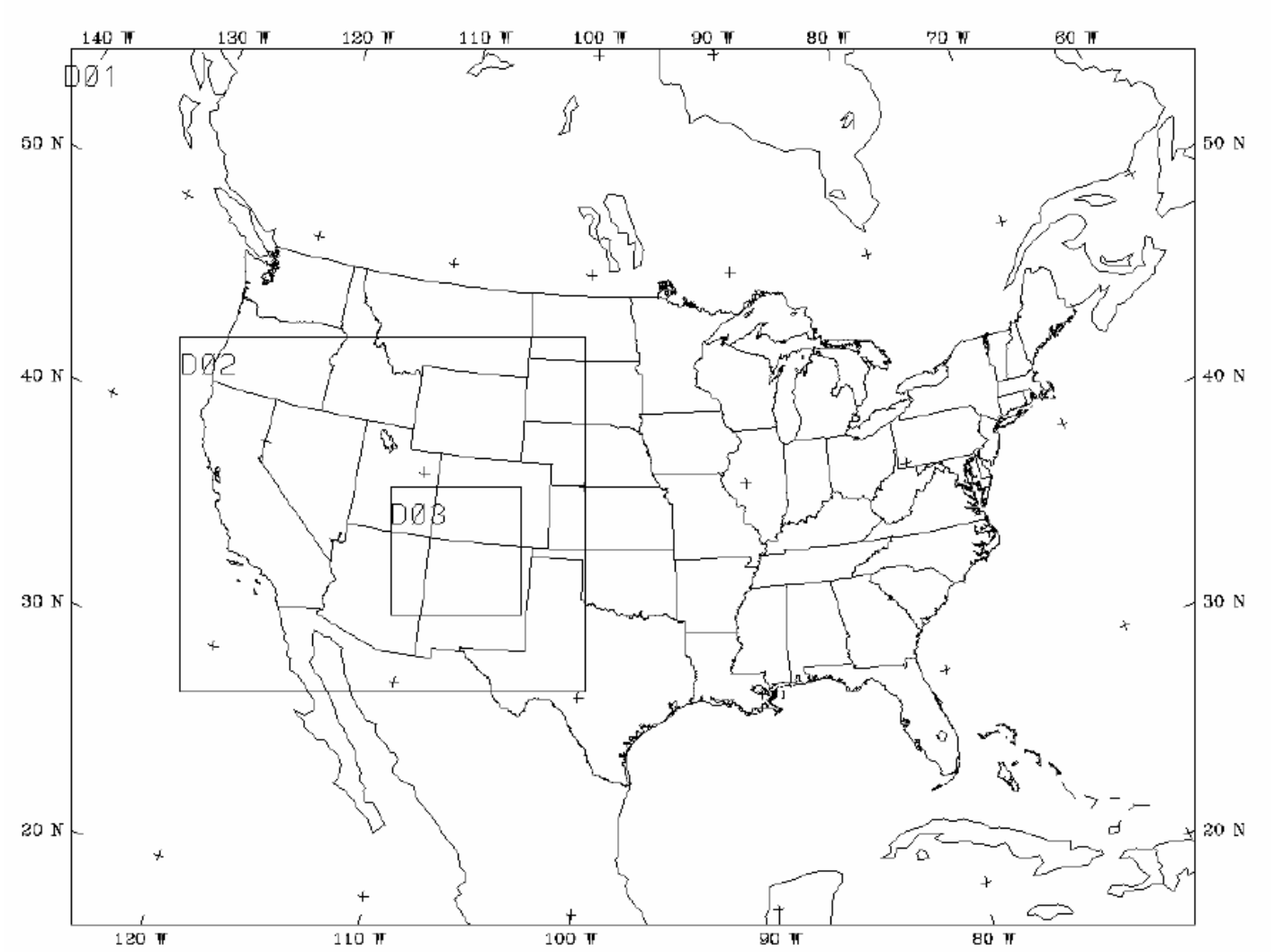
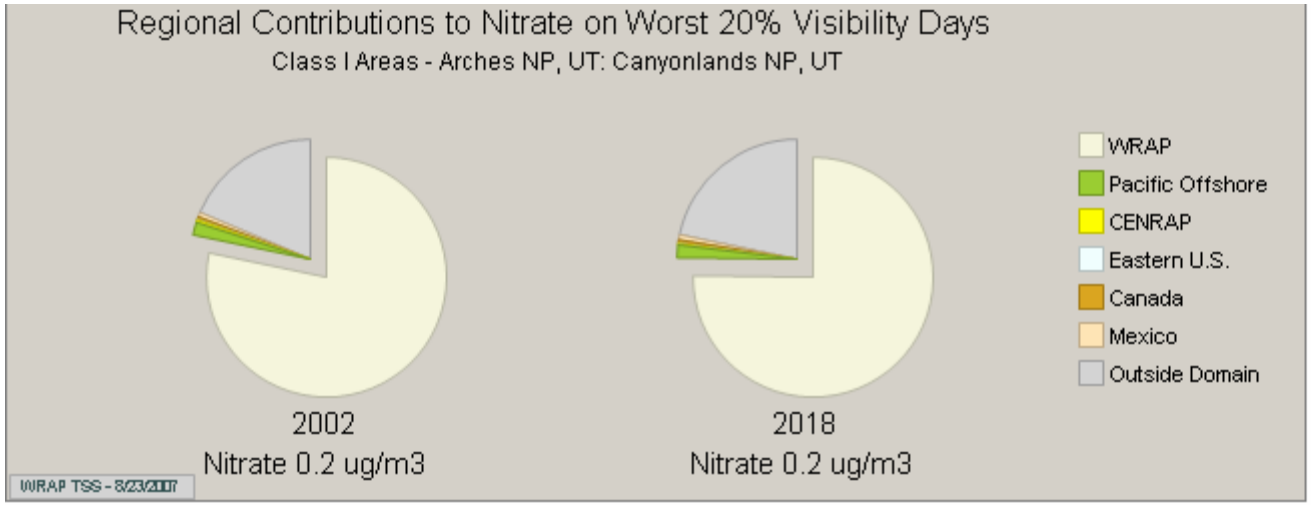
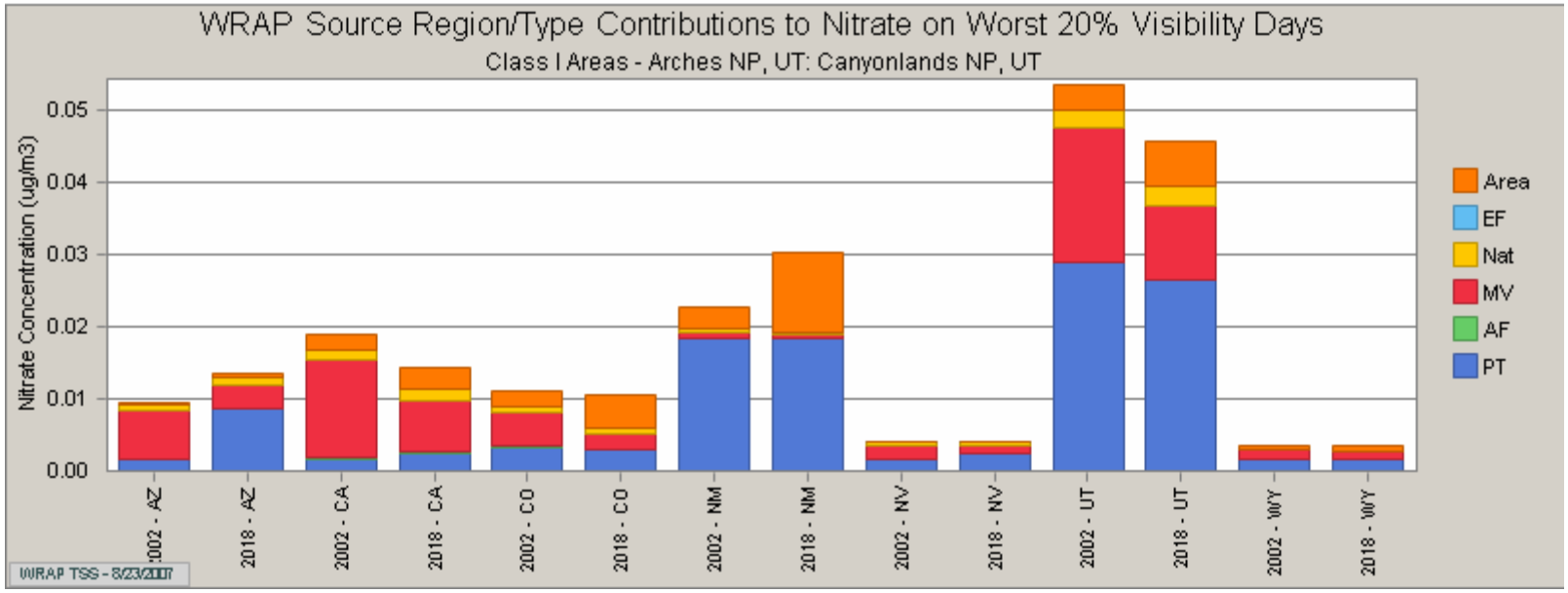


Figure 2-1. 2005 36/12/4 km MM5 modeling domain used in the NMED Giant PSD Increment Consumption Study.

Figure from ENVIRON 4-Corners Modeling Protocol


Regional Contributions to Nitrate on Worst 20% Visibility Days
Class I Areas - Arches NP, UT: Canyonlands NP, UT
WRAP
Pacific Offshore
CENRAP
Eastern U.S.
Canada
Mexico
Outside Domain
2002
Nitrate 0.2 ug/m3
2018
Nitrate 0.2 ug/m3
WRAP TSS - 8/23/2017


WRAP Source Region/Type Contributions to Nitrate on Worst 20% Visibility Days
Class I Areas - Arches NP, UT: Canyonlands NP, UT
Nitrate Concentration (ug/m3)
0.00
0.01
0.02
0.03
0.04
0.05
2002 - AZ
2018 - AZ
2002 - CA
2018 - CA
2002 - CO
2018 - CO
2002 - NM
2018 - NM
2002 - NV
2018 - NV
2002 - UT
2018 - UT
2002 - WY
2018 - WY
Area
EF
Nat
MV
AF
PT
WRAP TSS - 8/23/2017

Summary

- Monitoring
- O_3 and $PM_{2.5}$ are the pollutants of concern
- Limited monitoring shows upward trends
- Additional sites needed to establish baselines
- Modeling
- Address 6-points in protocol
- Protocols for primary pollutants look good
- Recommend regional modeling effort to address secondary pollutants
- Leverage available data sets and expertise